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Acuña, Andres

Departamento de Economía y Finanzas, Universidad del
Bío-Bío

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Determinants of Chilean youth voter registration: Evidence for the Bio Bio region*

Andrés A. Acuña **

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Abstract

Youth voter registration is a worldwide phenomenon that exhibits a marked decline over the last two decades. On this basis, this article presents evidence regarding those factors that determine the voter registration of Chilean youth, in particular, the inhabitants of Bio Bio region. The methodology uses a linear model, proposed by Silberman and Durden (1975), which considers a relationship between voter registration and several social/economic variables. The model is estimated using a dynamic panel for the Bio Bio region, which includes its 54 communes and 10 planning territories for the years 2003 and 2009. The results indicate that, at commune level, the main determinants of youth voter registration are citizen participation and poverty rates, while ethnic aspects are also affecting female voter registration, and only citizen participation rate has some influence over male voter registration. Finally, at territory level, the results show that citizen participation rate is a cross determinant of youth voter registration in the Bio Bio region.

Keywords: citizen participation, panel data, unobserved effects model, voter registration

JEL Classification: C23, O10, R0, Z0

*This research used data from the National socioeconomic characterization survey (CASEN). The author would like to thank the Ministry of Social Development, copyright owner of the survey, for allowing him to use the database. All results are the author's responsibility and they do not compromise the Ministry.

**Departamento de Economía y Finanzas, Universidad del Bío-Bío, Concepción, Chile. E-mail: aacunad@ubiobio.cl

1 Introduction.

Around the world, the evolution of youth voter population has shown a decline in its participation rate. In France, the proportion of non-registrants in 1983 was 11.3% against 10% in 2001. Nevertheless, its local abstention rate rose from 21.6% to 32.7% over the same period (Pan Ké Shon, 2004).

In Chile, the relative weight of youth population (i.e., 18-29 years old) in the electoral register has declined from 36% in 1988 to 9.71% in 2005. Moreover, youth voter registration has experienced a clear reduction from 90.7% in 1988 to 26.4% in 2005 (Toro, 2007).

The Bio Bio region suffers a similar phenomenon. In fact, youth voter registration has fallen from 43.4% in 2001 to 22.9% in 2010, a phenomenon that has clearly affected more men than women. The registration rate for the former has lost 23.4 percentage points, while the latter has lost 17.6 percentage points in the same period (see figure 1).

In 2010, the lower level of youth voter registration can be found in those planning territories¹ linked to urban centers, such as Penco (22.5%), Chillán (21.1%), and Bío Bío Centro (16.9%), which include three of four province capital in the Bio Bio region (see figure 2).

Currently, Chilean youth has been a key starring in the social movement that intends to lead and establish a reform process in the Chilean education system. On the other hand, National Congress of Chile has already started the discussion about a constitutional reform that establish automatic voter registration and voluntary (or mandatory) voting, a discussion that is still in progress.

These facts motivate the interest of the current paper on the voter registration phenomenon in the Chilean youth population. Therefore, it aims to generate evidence regarding those economic and social factors that affect the youth voter registration decision in Chile, in particular, the inhabitants of the Bio Bio region. This implies to answer the following questions: What are the determinants of Chilean youth voter registration? Are these determinants statistically different if geographical and gender aspects are considered?

The structure of the paper is as follows. The next section presents the methodology used in the empirical study. The third section discusses the main find-

ings obtained from the methodological framework. Finally, a fourth section compiles the main conclusions and identifies both limitations and future research.

2 Methodological approach.

The literature about voting rationality and voter participation is based on the pioneer work of Anthony Downs in 1957 (cited by Barzel and Silberberg, 1973), but it was mainly developed in the seventies. During this decade, the efforts were focused not only to giving theoretical support (Barzel and Silberberg, 1973; Silberman and Durden, 1975), but also to identify the determinants of voter participation as a social phenomenon (Frey, 1971; Settle and Abrams, 1976).

The proposed methodology follows Silberman and Durden (1975), whom argue a linear relationship between voter participation and several economic and social variables. The model is estimated using data from Chilean Electoral Service (SERVEL), National Institute of Statistics (INE), and National Socioeconomic Characterization survey (CASEN)². All these data sources enable to build a panel for the Bio Bio region in the 2003-2009 period. The proposed model is estimated considering two variants of political-administrative division (i.e., 54 communes and 10 planning territories) and gender perspective. The variables used in the estimation process are the following:

youthvoter: ratio between youth enrolled in electoral register and youth population.

lnwage: natural log for average real wage in Chilean pesos of 2009.

poverty: poverty rate for youth population.

ethnic: ratio between youth that belongs to an ethnic group and youth population. The ethnic groups included in the CASEN survey are aymara, rapa-nui, quechua, mapuche, atacameño, coya, kawaskar, yagán, and diaguita.

¹The list of communes that conform the Bio Bio region, by planning territory, can be found in Annex A.

²The CASEN survey has been applied since 1985 by Ministry of Social Development, former Ministry of Planning and known as MIDEPLAN, in order to capture information about the following modules: residents, education, labor market, income, health, and housing. Also, it includes some emergent topics, such as wealth and ICT, disability, poverty programs, ethnicity, migration, autobiography, and citizen participation.

particip: citizen participation rate for youth population in those activities listed in questions R18 and T18A, which are included in the CASEN 2003 and CASEN 2009 surveys, respectively (see Ministerio de Planificación, 2003, 2009).

ballot: dummy variable, which takes value of 1 if a ballot (e.g., presidential, senatorial and deputies, or mayor) occurs in the current period, and 0 otherwise.

urate: unemployment rate for youth population.

educ: average schooling rate for youth population.

The listed variables were built using data from the CASEN survey in its 2003 and 2009 versions. In addition, it was used information available at SERVEL, which enables to construct the youth electoral register for all the included variants (i.e., geographic and gender). The estimation technique considers two econometric approaches: unobserved effect and instrumental variables. The model was estimated assuming fixed effect between geographical entities³

Following Silberman and Durden (1975), the proposed model can be expressed by the following equation:

$$(1) \quad youthvoter_{i,t} = \alpha_1 lnwage_{i,t} + \alpha_2 particip_{i,t} + \alpha_3 ethnic_{i,t} + \alpha_4 ballot_{i,t} + c_i + \eta_{i,t}$$

Where the subscript i represents each of the 54 communes or 10 planning territories that make up the Bio Bio region, subscript t represents the years 2003 and 2009, c is the fixed effect for each commune or planning territory, and $\eta_{i,t}$ is the estimation error.

Since the wage rate for the youth population might be influencing the decision of “to participate or not participate”, then the *educ* and *urate* variables are used as instrumental variables in order to reduce the potential bias in the estimated coefficients and to correct any endogeneity issue.

Based on the foregoing, the next section develops the main findings obtained from the model estimation.

3 Main findings and discussion.

The model was estimated for the Bio Bio region considering both administrative division and gender ap-

proach, which originates six panels for the analysis. In this sense, the commune panel includes 52 of 54 communes (or municipalities) that make up the regional territory, because Hualpén and Alto Bío Bío were created on March 13 and April 22 in 2004, respectively. Therefore, there are not any register for these communes in the CASEN 2003 survey. However, by excluding the above communes from the commune panel does not affect the configuration of the territory panel. This is because they were originally part of Talcahuano and Santa Bárbara, respectively.

Given this, the model, represented by the equation (1), is estimated using the six panels previously defined. Then, the model is estimated again, but this time the variable *lnwage* is replaced by the variable *poverty*, because there is a negative economic relationship between them, in order to contrast the results already obtained with the new variant. Therefore, the model in its poverty rate version can be represented by the following expression:

$$(2) \quad youthvoter_{i,t} = \beta_1 poverty_{i,t} + \beta_2 particip_{i,t} + \beta_3 ethnic_{i,t} + \beta_4 ballot_{i,t} + c_i + \varepsilon_{i,t}$$

The results from the estimates for the Bio Bio region are discussed below.

3.1 Results for the model under its average income version.

The results from the estimates of the model under its average income variant, using the commune and territory panels, are compiled in tables 1 and 2, whose are analyzed in the current subsection.

At commune level, the results indicate that the main determinant of youth voter registration is the citizen participation rate (*particip*) at the 1% of significance level, which positively affects the registration rate. This indicates that those young people committed with several activities or instances of citizen participation have a greater willingness to not be self-excluded from democratic institutions.

However, there are differences between men and women inside this age group. Thus, the ethnic composition of youth population (*ethnic*) positively affects the female voter registration. On the other hand, the citizen participation rate (*particip*) is the main determinant of male voter registration at commune level, which is positively affected by this variable, an effect that is greater than that estimated at the aggregate level.

³For a wide discussion about unobserved effect models see Wooldridge (2002, Ch. 10 and 11).

In addition, it highlights the fact that neither the income level (*lnwage*) nor the making of an election, measured by the dummy variable *ballot*, affects the youth voter registration in the Bio Bio region under any dimension of analysis during the period 2003-2009.

At territory level, the estimates indicate that citizen participation rate is still the main determinant of youth voter registration in the Bio Bio region, which impact is higher than that estimated at commune level and statistically significant at 1%.

By gender, the main determinant of female voter registration is the citizen participation rate (*particip*), which effect is greater than that estimated at aggregate level. On the contrary, it is not possible to affirm, at an acceptable level of statistic significance, what variables are the main determinants of male voter registration at territory level.

Finally, the variables *lnwage*, *ethnic*, and *ballot* are not significant in any of the three panels considered in the estimation process.

3.2 Results for the model under its poverty rate version.

The results from the model estimates, using the commune and territory panels, are summarized in tables 3 and 4, whose discussion is developed below.

At commune level, the estimates indicate that the main determinants of youth voter registration are the poverty rate (*poverty*), which positively affects the registration rate, and citizen participation rate (*particip*), which coefficient is positive and less than that estimated in the average income variant. This indicates that young people are self-excluded from democratic life when they are in a situation of social exclusion.

By gender, the male voter registration is negatively affected by poverty rate and positively by citizen participation rate, but the estimated effects are greater than those obtained at the aggregate level. Similarly, the poverty rate and the ethnic composition of youth population are the main determinants of female voter registration. Moreover, it highlights that the estimated coefficient for the variable *ethnic* is positive, which means that the greater female ethnic population within a commune the higher the voter registration rate.

In addition, note that the constant, which can be interpreted as the average fixed effect, is significant at 1% level in all the commune panels considered under

the current model variant (i.e., poverty rate). Also, the estimated constant is coherent with that observed in reality. That is, in structural terms, the youth voter registration is always higher in women within the Bio Bio region.

Moreover, the variable *ballot* seems to have no significant effect on the phenomenon under study, so it was decided to remove it from the model under its poverty rate version.

At territory level, the estimates indicate that citizen participation rate is a cross determinant of youth voter registration in the Bio Bio region. That is, the estimated parameters for the variable *particip* are statistically significant at 5% level and their highest magnitude can be observed in the female panel.

By gender, the main determinants of female voter registration are the citizen participation (*participf*) and poverty rates (*povertyf*). On the other hand, not only the citizen participation rate affects the male voter registration but also the weight of ethnic groups within young population, whose estimated parameters are positive and negative, respectively.

4 Concluding remarks and research limitations.

The youth apathy for participating in activities of a democratic system is a local and global concern that deserves the attention of authorities, public, and academic community. In this sense, the current empirical research aimed to identifying the structural variables that influence the voter registration rate of Chilean youth, in particular, those who inhabit the Bio Bio region, and to quantifying their impact. Thus, from the application of the proposed methodological approach, is possible to arrive to the following conclusions.

At commune level, estimates suggest that the main determinants of youth voter registration are citizen participation and poverty rates, only if the latter is included in the analysis, over variables such as average income or ethnic composition of young population. By gender, citizen participation rate only influences male voter registration, while female voter registration is mainly affected by a higher presence of indigenous people.

At territory level, the results are similar to those already analyzed, but it highlights the greater effect of citizen participation rate on female voter registration. Similarly, to including the poverty rate in the model generates for the citizen participation rate a

higher coefficient than that originally estimated, specially in the female panel. In addition, it highlights the negative effect of the ethnic composition of young male population on its voter registration rate.

Overall, there is statistical evidence to claim that the making of an electionary process during the analysis period has no influence on the youth voter registration within the Bio Bio region. This result suggests a warning scenario, because the making of several elections, such as mayor, deputies and senators, or presidential, seem to have not motivated the young population to get involve into the civic life and to express its will regarding to the political framework that prevails in Chile.

Within the research limitations there are the following. Firstly, there are not available yearly data for all the economic and social variables, despite it is possible to find them for electoral variables. Secondly, the citizen participation module was eliminated from CASEN 2006 survey (Ministerio de Planificación, 2006), which provoked a reduction in the time dimension of the panel data. Thirdly, there is a statistical error associated to the commune expander used in the CASEN survey, which gives the character of “proxy” to all the variables that were used in the estimation process. A situation that increases to some extent the bias on the estimated parameters. Finally, it is difficult to count with additional disaggregated information for all the communes in order to incorporate new control and/or instrumental variables that enable to tune up the obtained results.

Despite the above research limitations, and given the scarce Chilean literature that addresses the subject, this is a first regional approach to the youth voter registration phenomenon, which incorporates the geographical and gender approaches as added value. Therefore, the next step is to expand the panel data to the 346 communes that make up the Chilean territory, which will enable to capture in a better way the heterogeneity of the population group that motivates this research.

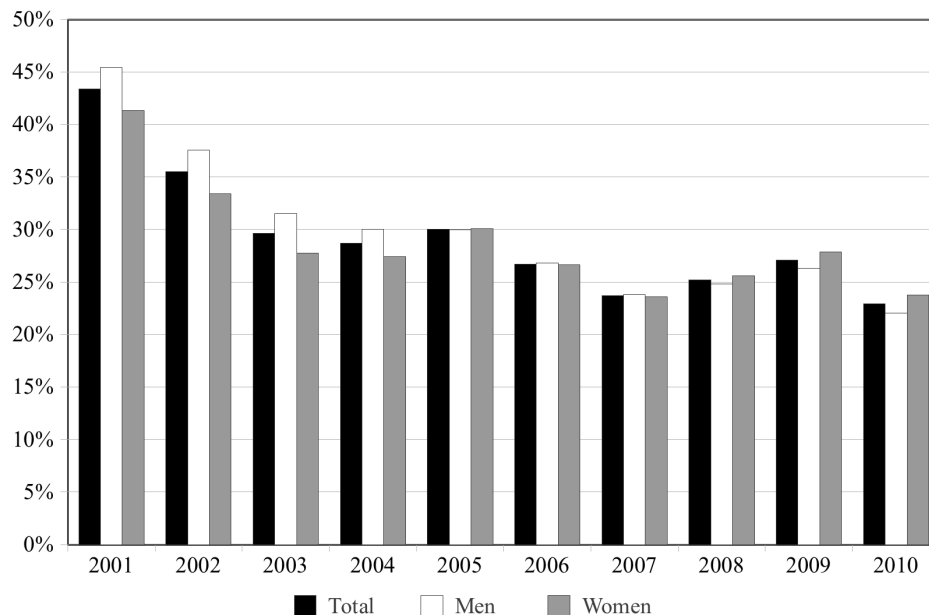
Finally, and as an overall concluding remark, it is possible to claim that any action aimed to increasing the social inclusion of young population, such as encouraging several instances of citizen participation, the recognition of indigenous people, or improving its inclusion in the labor market, will provoke a higher involvement that will strengthen the Chilean democratic institutions. This will determine without any doubt both the operative success of the bill that aims to set the automatic voter enrollment in Chile and the

strengthen of democratic principles and social capital of Chilean society in the future.

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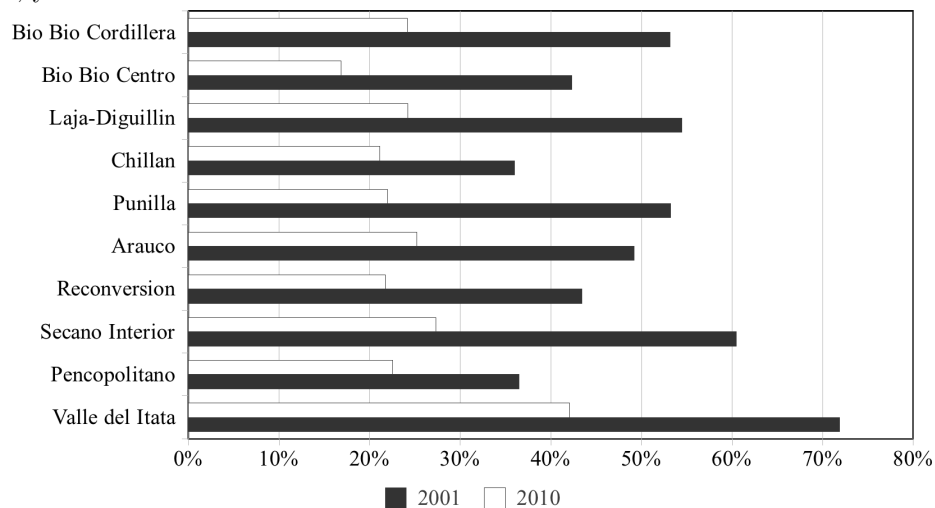
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Figure 1: Youth population (i.e., 18-29 years old), by gender, enrolled in the Electoral Register, Bio Bio region, period 2001-2010.



Source: Electoral Service and National Institute of Statistics, Chile

Figure 2: Youth population (i.e., 18-29 years old), by planning territory, enrolled in the Electoral Register, Bio Bio region, years 2001 and 2010.



Source: Own elaboration based on data from Electoral Service and National Institute of Statistics, Chile

Table 1: Estimated coefficients for the commune model under its average income version, by gender and whole panels.

Variables	Whole panel	Male panel	Female panel
<i>constant</i>	-7.5108 (3.7160)	-2.0204 (2.2513)	0.1604 (0.5807)
<i>lnwage</i>	0.6503 (0.3085)	0.1870 (0.1787)	0.0212 (0.0464)
<i>particip</i>	0.2667 ^a (0.0442)	0.4405 ^c (0.2421)	-0.1109 (0.1059)
<i>ethnic</i>	0.5158 (0.2844)	0.1142 (0.3111)	0.2339 ^c (0.1393)
<i>ballot</i>	-0.1638 (0.0946)		
Instruments:	<i>educ, urate</i>	<i>educ, urate</i>	<i>educ</i>

a: Significant at 1% level; b: Significant at 5% level; c: Significant at 10% level
Source: Own elaboration

Table 2: Estimated coefficients for the territory model under its average income version, by gender and whole panels.

Variables	Whole panel	Male panel	Female panel
<i>constant</i>	0.4015 (0.6754)	0.1989 (4.2108)	-0.3556 (3.1980)
<i>lnwage</i>	-0.0129 (0.0549)	0.0036 (0.3321)	0.0463 (0.2669)
<i>particip</i>	0.3073 ^a (0.0829)	0.3733 (0.5482)	0.4140 ^b (0.1809)
<i>ethnic</i>	0.0202 (0.2487)	-0.5631 (0.5419)	0.4141 (0.8193)
<i>ballot</i>			0.0086 (0.0828)
Instruments	<i>educ, urate</i>	<i>educ, urate</i>	<i>educ, urate</i>

a: Significant at 1% level; b: Significant at 5% level; c: Significant at 10% level
Source: Own elaboration

Table 3: Estimated coefficients for the commune model under its poverty rate version, by gender and whole panels.

Variables	Whole panel	Male panel	Female panel
<i>constant</i>	0.4392 ^a (0.0021)	0.4062 ^a (0.0097)	0.4752 ^a (0.0289)
<i>poverty</i>	-0.2657 ^b (0.0057)	-0.4009 ^a (0.0305)	-0.2189 ^b (0.1032)
<i>particip</i>	0.1121 ^b (0.0033)	0.3096 ^a (0.0141)	-0.0926 (0.0597)
<i>ethnic</i>	0.0055 (0.0079)	0.0066 (0.0212)	0.2687 ^c (0.1483)
<i>ballot</i>			
Instruments	<i>educ, urate</i>	<i>educ, urate</i>	<i>educ, urate</i>

a: Significant at 1% level; b: Significant at 5% level; c: Significant at 10% level
Source: Own elaboration

Table 4: Estimated coefficients for the territory model under its poverty rate version, by gender and whole panels.

Variables	Whole panel	Male panel	Female panel
<i>constant</i>	0,2409 ^a (0,0639)	0,2139 ^c (0,02483)	0,2823 ^b (0,0314)
<i>poverty</i>	-0,0039 (0,1779)	0,1433 (0,0379)	-0,3109 ^c (0,0891)
<i>particip</i>	0,3286 ^b (0,1319)	0,3328 ^b (0,0112)	0,4397 ^b (0,0528)
<i>ethnic</i>	-0,0111 (0,4843)	-0,4089 ^b (0,0171)	0,7509 (0,4061)
<i>ballot</i>			
Instruments	<i>educ, urate</i>	<i>educ, urate</i>	<i>educ, urate</i>

a: Significant at 1% level; b: Significant at 5% level; c: Significant at 10% level
Source: Own elaboration

Annex A: List of communes, by planning territory, that conform the Bio Bio region, Chile.

Planning territories	Communes	Planning territories	Communes
Valle del Itata	Cobquecura	Arauco	Arauco
	Coelemu		Cañete
	Ninhue		Contulmo
	Portezuelo		Curanilahue
	Quillón		Lebu
	Quirihue		Los Álamos
	Ránquil		Tirúa
	San Nicolás		
	Treguaco	Chillán	Chillán
Pencopolitano	Chiguayante		Bulnes
	Concepción		Chillan Viejo
	Hualpén		El Carmen
	San Pedro de la Paz		Pemuco
	Talcahuano		Pinto
	Tomé		San Ignacio
	Penco		Yungay
Secano Interior (AMDEL)	Cabrero	Bío Bío Centro	Laja
	Florida		Los Ángeles
	Hualqui		Nacimiento
	San Rosendo		
	Santa Juana	Bío Bío Cordillera	Antuco
	Yumbel		Alto Bío Bío
			Mulchén
			Negrete
			Quilaco
Reconversión	Coronel		Quilleco
	Lota		Santa Bárbara
			Tucapel
Punilla	Coihueco		
	Ñiquen		
	San Carlos		
	San Fabián		

Source: Unidad de Gestión de Información Territorial (UGIT), Regional Government of Bio Bio